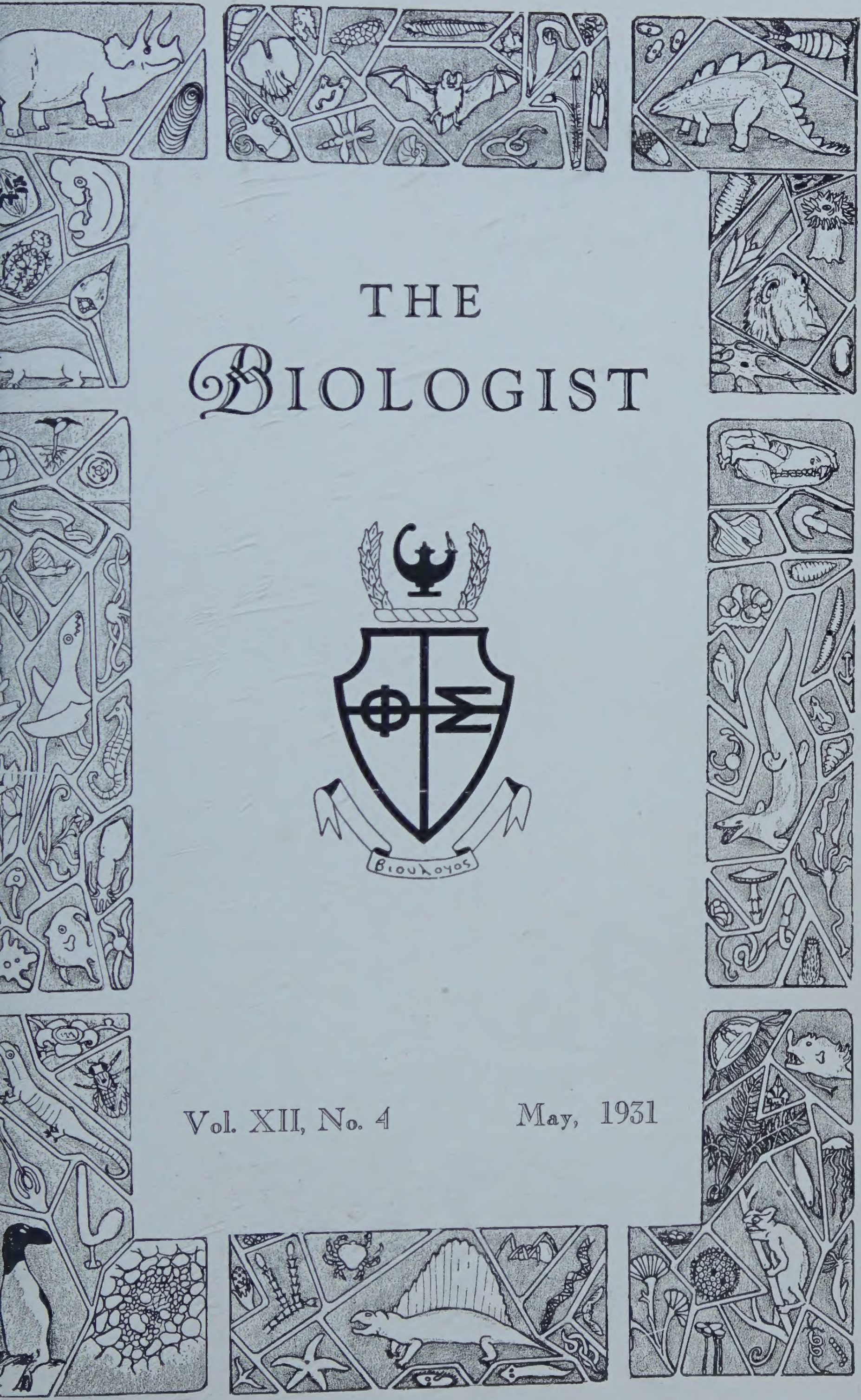

THE BIOLOGIST

Vol. XII, No. 4 May, 1931

THE BIOLOGIST

OFFICIAL QUARTERLY PUBLICATION

OF THE

PHI SIGMA SOCIETY

Volume XII Denver, Colorado, May, 1931 Number 4

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University, March 17, 1915.

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THE BIOLOGIST

Volume XII May, 1931 Number 4

THE EDITOR SAYS—

This issue of the BIOLOGIST goes to press with about half enough material to warrant its publication.

Three excellent articles on well known freshwater biological stations challenge the interest of the members of Phi Sigma. Our thanks are due to Drs. Johnson, Martin, and Reynolds, of Wyoming, Iowa, and Virginia Universities for their cooperation. There are other freshwater biological stations in the country but their directors, like Martha, must be "busy about much serving,"—or maybe they do not think the BIOLOGIST important enough to warrant the trouble of preparing an article for it.

Which brings us to a ticklish question. What do *you* think of *your* BIOLOGIST? Does it meet your ambitions of what the official organ of Phi Sigma ought to be?

The present policy of the Council calls for four issues a year,—one in winter to report on actions of the convention or council sessions, a spring issue to deal with biological stations, a summer and fall issue to carry Fraternity news. To date your Chapter Secretaries, Editors, and convention Delegates have sent in no material or news of any kind for the forthcoming issues. Of what use is an Editor if he has nothing to edit?

Now then: Mimeographed letters will have been sent to all Chapter Secretaries by the time this reaches you. If the next issues of the BIOLOGIST are to be really representative of Phi Sigma, it will be up to the membership to see that the Editor is kept supplied with *live, interesting* Chapter news. It is not enough for the Chapter officers to say, "Heck! all the Digamma Chapter members know what's going on here at *Mastodon*. Why put it in the BIOLOGIST? Nobody else will read it anyway." And in that answer we have several interesting biological reactions:

1. Retrogressive tendencies.
2. Progressive fossilization.
3. Ultimate sterility.

What to do? Several vagrant ideas have been agitating the editorial cranium. Call them ''the idle thoughts of an idle fellow'' if you will, but here they are:

Why not have a regular *quarterly* report from every Chapter?

Why not have short, snappy, articles on what the Biological leaders on your campus are doing?

Why not have an occasional picture of such personages, or groups of personages?

Why not have an open forum column?

Why not nominate somebody, the Vice-Chancellor (who will not thank us for the suggestion!) or the Editor, or some other officer, to conduct a question box?

Why not suggest something yourself?

Your Editor is profoundly convinced that we only need to get something original started and the members will be mobbing the Chapter secretaries to get their copies of each issue.

Let us have your personal sentiments on these points.

COLORADO

The Rocky Mountain Biological Laboratory at Crested Butte

By DR. J. C. JOHNSON, *Pennsylvania State Teachers College*

Few informed individuals will question the statement that every important biological region in the United States should have a strong biological laboratory for study and research for qualified advanced students of biology and for independent investigators. Such laboratories naturally are used chiefly in the summer time, although, if possible, they should be open throughout the year.

Fewer still will question that the Rocky Mountain region constitutes an important biological area.

Emerald Lake, North from the Laboratory.

Although a number of institutions, more or less biological in nature, have sprung up from time to time in various parts of the Rockies, none of them seem to have survived the period of the great world war. Because of the very evident need for an independent biological research laboratory in the Rockies, a group of professors of biology from the University of Oklahoma, the University of Illinois, and a state college in Colorado, applied to the Secretary of State for a charter to incorporate (for non-profit) under the name of the Rocky Mountain Biological Laboratory. Although the headquarters of the laboratory are at "Gothic", the nearest post-office and railway station is at Crested Butte, Colorado, some eight miles distant.

Although most of the founders of this laboratory had been associated at a summer biological station in the Rockies for some six years, formal organization and incorporation did not take place until April, 1928. The coming season then will mark the fourth year of its official and legal existence.

During the same year, because of the need for more room for expansion, and because of the finding of a more desirable area for study, research, and recreation in the large Gunnison National Forest, the present site of the laboratory, consisting of about seventy acres, was purchased from the Gunnison County Commissioners.

Locally, the site of the laboratory is known as "Gothic", named for a high mountain close by, some 12,636 feet in elevation, whose eastern face consists of numerous Gothic-like cliffs and towering rock walls. Actually, however, Gothic ceased to exist as a post-office, perhaps forty years ago.

In the early 80's Gothic was such a prominent western mining camp that ex-President Grant on his world tour stopped in this booming mountain town, surrounded by unexcelled beauty, located literally in the heart of the Colorado Rockies. To fail to stop at this prominent and bustling mining camp would have been almost as unexcusable as for Lindbergh to fail to stop in Washington, D. C. or New York on his return from Paris.

Today, however, only the more substantial of the early buildings are left in this formerly thriving mining center, and these remaining buildings together with some four others of more recent origin constitute the buildings now owned by the corporation known as the Rocky Mountain Biological Laboratory. It is interesting also that two of the original inhabitants of Gothic in the 80's return each summer to look after their financial interests—and incidentally tell to the investigators and students at the laboratory from the East, South, North and West, of its former grandeur and prominence as a mining center when the West was young.

The Rocky Mountain Biological Laboratory is located in the midst of the million-acre Gunnison National Forest, in Gunnison County, in the west-central part of Colorado close to and on the west side of the continental divide. An area more suited to biological study and investigation would be hard to find anywhere in the United States. It is located in virgin territory, and is in many ways almost as primitive as the interior of Africa.

To find such an area still left untouched and unspoiled by tourists, fishermen, and campers, who flock by the hundreds of thousands to the national and state parks, and "dude" ranches was indeed fortunate.

To insure the perfection of this biologists paradise in its primitive condition, the United States Forest Service and the Department of Game and Fish of Colorado have co-operated wholeheartedly and they richly deserve the thanks of all investigators and students of biology, and true sportsmen, for their forward-looking policy.

Whiterock Mountain (13,232 feet) about two miles East from Laboratory.

Just a short distance above the laboratory buildings, an area comprising some 904 acres has been recently set aside by the U. S. Forest Service as the "Gothic Natural Area" to be used as a research reserve by qualified investigators in the fields of biology and forestry. From this area all grazing and other commercial activities carried on by the Forest Service are restricted. As the years go by this natural area will undoubtedly become more and more unique and valuable to investigators in the several branches of biology.

A few years ago the State Legislature of Colorado, on recommendation of the Department of Game and Fish, set aside a State Game Refuge of some 250,000 acres, within an hour's ride from the laboratory. Although light grazing is permitted here under the control of the U. S.

Forest Service, the region is in almost its original primitive condition and is likely to remain so indefinitely. This area also is of unrealized value to the present and future students and investigators in the biological sciences.

The peculiar fitness of Colorado to become the summer mecca of biologists for those studying the Rocky Mountain flora and fauna has not been widely understood as yet. In the first place, Colorado has the highest average elevation of any State in the Union (6,800 ft.) and the greatest range in elevation of any State, not bordering on the Pacific Coast (from about 3,500 to over 14,000 ft.). It is cool and comfortable all summer long.

Over two-thirds of all the mountains in North America of over 14,000 feet in elevation are in Colorado. Twenty-six of these are higher than the famed Pike's Peak, and six of these are within a one-day hike, or horse back ride, from the laboratory. Numerous peaks over 10,000 ft. in elevation are on all sides, and at the foot of one of them, Gothic Mountain (12,636 ft.), the laboratory buildings are located.

Because of the great variation in altitude from 8,000 to over 14,000 feet, and because the rainfall is very varied, from nine to about forty inches annually, the plant and animal life is both extremely varied and abundant. New species are found every year.

With numerous high mountains on all sides, with many open parks, abundant forests, lakes, streams, alpine meadows, snow masses, meadows, swamps, mesas, and dry areas, it is easy to understand why every student and investigator who has been to the laboratory is so enthused about the Gothic area as a site for a summer biological laboratory.

The fact that the population in Gunnison County in general and the Gothic area in particular is and always has been sparsely populated (except for two or three boom years of half a century ago) has preserved the entire region in its natural condition to a very great degree.

Since the first year of its incorporation all instructors at the laboratory have possessed the doctor's degree and also have held responsible positions in Zoology and Botany departments of Universities and Colleges. It is the intention of the Board of Trustees of the laboratory to maintain this high standard in the future.

The following are the officers of the laboratory:

President—Dr. A. Richards, Professor of Zoology, the University of Oklahoma, and Director of the Biological Survey.

Vice-President—Dr. Francis Ramaley, Professor of Botany and Chairman of Biology Department, the University of Colorado.

Secretary—Attorney Clifford H. Stone, Gunnison, Colorado.

Treasurer—Dr. A. O. Weese, Professor of Zoology, the University of Oklahoma.

Dr. John C. Johnson, Professor of Biology and Chairman of The Department of Science, Pennsylvania State Teachers College, West Chester, has since its beginning, been the Director of the Laboratory.

Gothic Mountain (12,636 feet). Laboratory Buildings Located at Foot of this Mountain, about Center of the Picture.

The following Departments of Instruction and Research are regularly maintained:

Ecology—Dr. A. O. Weese in charge.

Field Botany—Dr. Paul B. Sears in charge.

Field Zoology—Dr. L. A. Adams in charge. (Given in 1931 by Dr. A. I. Ortenburger.)

Parasitology—Dr. John C. Johnson in charge.

In addition to the four regular departments there is the department of "Special Courses" with Dr. A. Richards in charge. The courses in this department vary from year to year depending upon the personnel of the staff. This coming summer, the two following courses will be given:

Genetics—Dr. Mildred Hoge Richards.

Comparative Embryology—Dr. A. Richards.

Other professors from other standard universities and colleges, upon application and approval of the Director, may bring biology students with them and offer them instruction there in any course not otherwise provided by the laboratory. The privileges of the laboratory and the dining room are extended to all such on the same basis as the other students and investigators.

Further information on this point or any other activity of the laboratory, and the regular annual bulletin, may be secured on application to the Director.

Membership in the corporation is limited to those holding responsible positions of biology in universities, colleges and high schools. Any individual, however, primarily interested in biology, whether student or instructor, is cordially invited to the laboratory for study or research, or both, on the flora and fauna of the Rocky Mountain region.

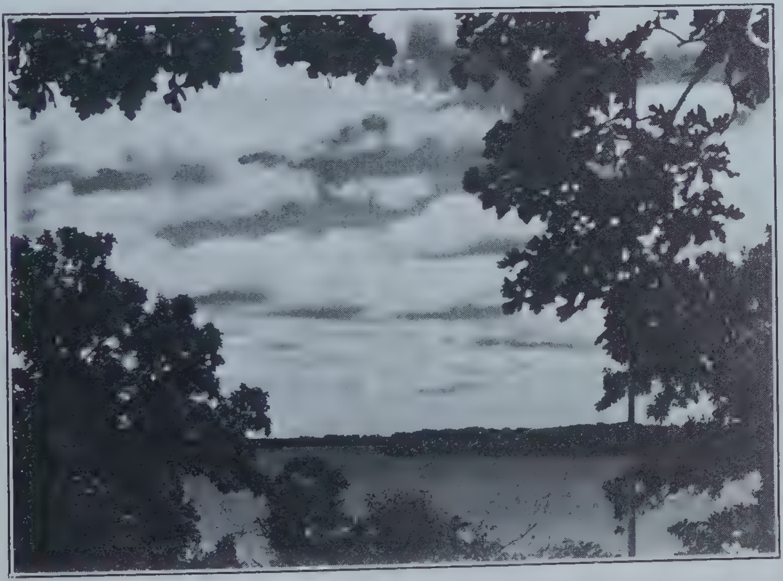
John C. Johnson, Director
(Winter Address) 121 Linden St.
West Chester, Pennsylvania.

IOWA

Lakeside Laboratory at Lake Okoboji

By DR. G. W. MARTIN, *University of Iowa*

The Iowa Lakeside Laboratory was founded in 1910 by Dr. Thomas H. Macbride, at that time Professor of Botany in the University of Iowa, later president and now president emeritus of the University. Associated with him in the work of the early years was Professor Bohumil Shimek, known for his investigations of the prairie flora and still an active worker in the field of ecology. For some years previous to 1910 these two men had conducted summer field classes in the lake region of northwestern Iowa, and they had both been impressed with the need for a field station in an environment not duplicated by that of any other station.



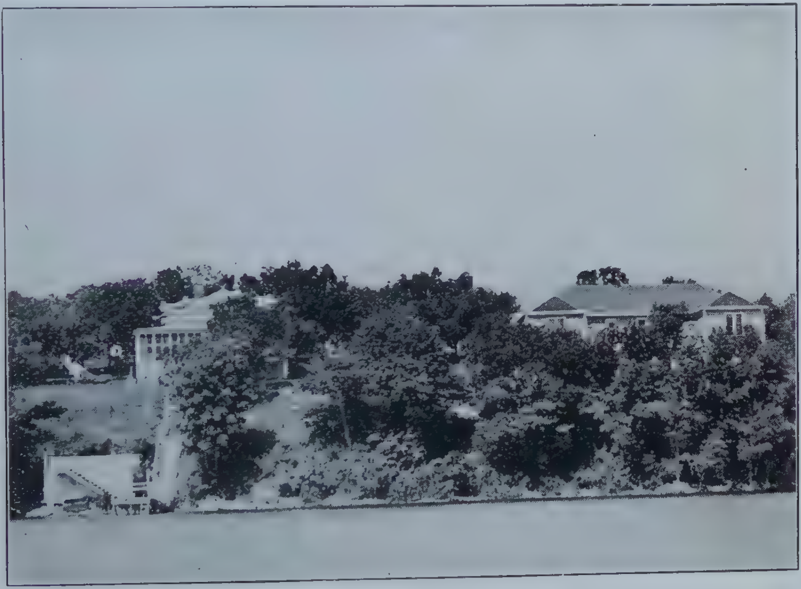
Iowa Lakeside Laboratory—View from Laboratory Across West Okoboji Lake.

The group of lakes in the Okoboji region comprises Spirit Lake, West Okoboji Lake, East Okoboji Lake and a large number of smaller lakes ranging down to numerous ponds and kettle holes. The shores are for the most part steep and in the form of wooded bluffs, originally covered with an oak, elm, ash forest. Much of this border forest still remains. The surrounding country is rolling prairie, and while it is now largely under cultivation, a number of tracts of prairie remain within easy walking or motoring distance of the laboratory. The lakes themselves are mostly rather shallow, but West Okoboji Lake, upon the shore of which the Laboratory is situated, is a hundred and forty feet deep, an unusual depth for a prairie lake. The phytoplankton of these waters is extremely rich in number and variety of species, and while a considerable amount of study has been devoted to it, much remains to be learned. The animal plankton has been less extensively studied but the indications are that it is equally rich and varied. In the shallow areas there are extensive beds of aquatic phanerogams with their peculiar accompanying animal associations.

Iowa Lakeside Laboratory—Campus from Miller's Bay.

Frogs, salamanders and turtles are abundant and a rich and varied bird life is available for study either at the laboratory or near at hand. For the botanist working with land plants, there is wide range at hand in prairie, forest and marsh.

The Laboratory itself is privately owned, title being held by a group of alumni of the University of Iowa, who maintain the property and turn it over to the University for operation as a field station. The actual operation is under the joint auspices of the Summer Session and the Graduate College of the University. There are two terms of five weeks each and two courses are given each term, one in field botany and one in field zoology. Students taking these courses give their entire time to a single course. It has been found by experience that in work of this sort there is a decided advantage in having the study intensive, and in leaving the instructor free to use the entire time of his group, planning field work and laboratory study as his material demands without having to consider the schedule of some other class. The courses are open to students with a year's collegiate work in biology, but are sufficiently flexible so that students with more experience, by giving particular attention to minor problems, may take them with advantage, receiving undergraduate, or with certain restrictions, graduate credit for completing them satisfactorily. Side by side with the course work, provision is made for directed research in animal and plant ecology, in various phases of hydrobiology and in mycology, as well as for the accommodation of independent investigators.



Iowa Lakeside Laboratory—Laboratory Buildings from Lake.

Life at the laboratory is simple. The laboratory building is a very plain wooden structure. A comfortable headquarters cottage with a large porch, contains two large common rooms. together with living quarters for several persons; smaller cottages and a dormitory housing the others. Board is at a common mess. The attempt is made to keep costs down to the lowest possible limit. Room and board range from six to seven dollars a week. Tuition is at the regular University rate.

During the summer of 1931 the work in zoology will be given by Professor Ira T. Wilson of Heidelberg College. Professor H. S. Conard will be in charge of the work in botany the first term; Dr. Arthur P. Kelley the second.

From the beginning the emphasis of the laboratory has been upon the familiar plants and animals to be found near at hand everywhere throughout the north central United States. Fully recognizing the value of experience with the less familiar forms of mountain and seashore, it is felt that for those who are living and working, and, particularly for those who are teaching in this region, nothing can take the place of an intimate acquaintance with everyday living forms.

The campus contains nearly a hundred acres. The laboratory buildings are on a wooded bluff above the lake, but the grounds include a wide range of habitats, embracing forest border, prairie, hanging bay and swamp, and nearly surrounding a shallow bay, filled with larger aquatic vegetation, thus providing on our own grounds abundant material for study. For the teacher of biology and general science in an inland school, we believe we can supply valuable training and experience.

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VIRGINIA

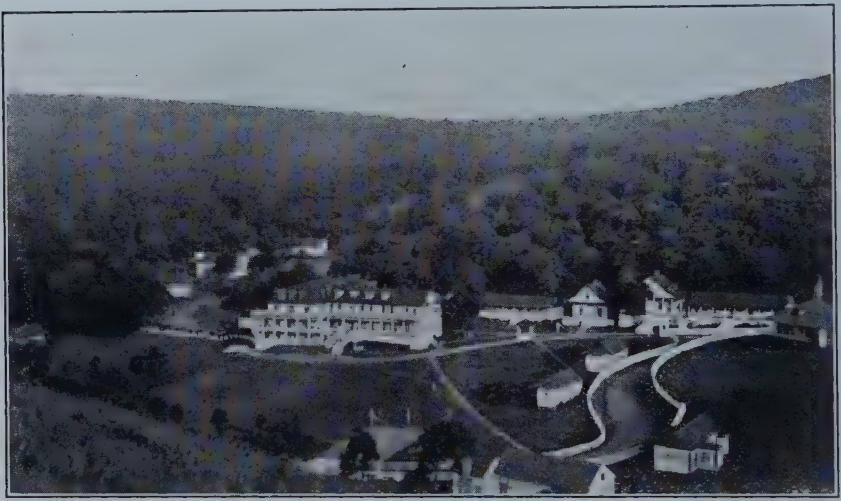
The Mountain Lake Biological Station in Giles County

By DR. B. D. REYNOLDS, *University of Virginia*

Microscopic biology is relatively a new science. With its development the need for places to work where natural conditions had not been altered by encroaching civilization became evident. The first reaction to this necessity was the establishment of marine biological stations. In view of the fact that most educational institutions are not located near bodies of salt water there was a certain incongruity in training teachers to be familiar with marine life, while their local pools were teeming with slightly different organisms. In order to correct this situation there have been a number of fresh-water biological stations established during the past few years—and judging from their productivity, their usefulness cannot be denied.

Mountain Lake Biological Station of the University of Virginia.

The need for a biological station in Virginia has been increasingly felt during the past decade. In 1927 a survey was made of the biological courses taught in the various summer schools of the state. This survey indicated that most of the instruction given in biology during the summer was of an elementary nature. The rapid increase in the number of students registering for advanced work in biology since graduate courses were added to the University of Virginia's summer quarter curriculum in 1924, pointed to the fact that this subject was not being properly emphasized in the South. Following in wake of the apparent trend, a committee was appointed to study the situation. After two years study a report was submitted on October 16, 1929. This report recommended that a fresh-water biological station be established, preferably at Mountain Lake; the work given at the station should be primarily of an advanced nature; and the University of Virginia, as the principal center of graduate work in the state, should assume responsibility of operating the station. Furthermore, emphasis was placed on the desirability of inviting the co-operation of other colleges and universities in the country, especially those in Virginia and adjoining states.



The Hotel and Some of the Cottages. A Rear View of the Laboratory May be Seen in the Foreground. The Long Building at the Right is the Women's Dormitory.

As constituted at present, the station is under the direction of Dr. Bruce D. Reynolds and Dr. Ivey F. Lewis, of the University of Virginia.

During the first year instruction was given in: Taxonomy and Ecology of Plants; Plant Cytology; Plant Morphology; Taxonomy and Ecology of Animals; Invertebrate Zoology; Protozoology; and Helminthology. The teaching staff consisted of Professors I. F. Lewis and B. D. Reynolds (U. of Va.); A. B. Massey (V. P. I.); R. P. Carroll (V. M. I.); L. R. Cleveland (Harvard); and J. W. Nuttycombe (U. of Tenn.).

Essentially the same courses will be given during the summer of 1931. The faculty will consist of I. F. Lewis and B. D. Reynolds (U. of Va.); P. A. Warren (W. & M.); L. L. Woodruff (Yale); and Conway Zirkle (U. of Penn.).

The Beautiful Cascades During a Dry Season.

The summer's work is divided into two terms of five weeks each, with classes meeting six days a week. The first term begins June 29th and the second term begins August 3, (1931). The terms are independent of each other and students may register for either, or both.

Registration is open to both white men and women who have had a minimum of six session hours of college credit in biology. The courses may be taken either for graduate or undergraduate credit, but they are designed primarily for those working toward advanced degrees. Some of the courses should be of particular interest to those who are teaching biology in high schools and secondary colleges, while others would be beneficial to medical students and public health workers.

Limited space makes it possible to offer laboratory facilities to only a few persons for research purposes, but plans are being made to have this corrected in the near future. Two research rooms are available and they will be placed at the disposal of deserving investigators.

Mountain Lake is located in Giles County, Virginia, at an elevation of 4,000 feet above sea level. The lake, from which the name is derived, is located on top of Salt Pond Mountain. It is a body of clear water with a surface area of approximately 150 acres and a maximum depth of 110 feet. Rising from its shores, Bald Knob peak reaches an altitude of 4,348 feet, one of the highest points in the state. Extensive stretches of wooded, mountainous terrain surround the lake and in the vicinity are freshwater streams, one of which tumbles over rocks seventy feet high to form the beautiful Cascades. The place is truly a nature-lover's paradise. The mean temperature for the summer months is approximately 68 degrees, the nights being remarkably cool. There are no mosquitoes present and only a few other insect pests are found.

A Group of Faculty and Students in Front of the Laboratory.

For many years Mountain Lake has been operated as a summer resort, the number of guests ranging from 150 to 200 during the height of the season. As a consequence, ample sports and social opportunities are afforded.

Mountain Lake is approached by two roads, one from Newport, which is about nine miles, and the other from Pembroke, approximately seven miles distant. The latter is the freight and express station. Newport has a population of around 300 and Pembroke about 500. Each day motor cars are sent to Pembroke for mail, passengers, groceries, etc. Neither of the roads is hard surfaced, but both are passable throughout the summer. Pembroke is on the Norfolk and Western and Virginian Railways, about seventy miles west of Roanoke. An excellent hard-surfaced highway is within five miles of the laboratory. Persons driving from the east should pass through Roanoke, Va., from the southwest they should come via Bristol, Va., and from the northwest they should come via Princeton, W. Va.

One of the large cottages has been converted into a laboratory. Each room is supplied with water, electricity, tables, and other facilities, while such laboratory equipment as is needed is transported from the University of Virginia.

Other cottages have been converted into dormitories—one for women students and one for men. Meals are served in the hotel dining room. By special arrangements with the management, students receive board and rooms, including linen and bedding, at the reduced rate of $16.00 per week.

The aim of the Mountain Lake Biological Station is to afford a center where biologists from the State of Virginia and other Southeastern States in particular, and from the country in general, may gather to pursue advanced studies of plants and animals under ideal climatic conditions, in a region possessing a bountiful flora and fauna.

During the first summer excursions into the field revealed a surprising wealth of biological forms—many of which are rare, or undescribed, species. While observations covering conditions relative to all forms of life have not been made, enough has been done to indicate that this region is exceptionally good for fungi, bryophytes and pteridophytes among plants and for protozoa, rhabdocoeles, arthropods, birds and mammals among animals. Among the most interesting finds is a wood-eating cockroach, discovered by Dr. Cleveland of Harvard University. This primitive insect contains intestinal protozoa similar to those harbored by the native termites. Dr. Cleveland and his colleagues are now working on problems arising from this find.

Within a radius of five miles collections can be made from tributaries of the James and Mississippi Rivers, and from places with a difference of 2,500 feet in altitude.

A BIOLOGIST—TO BE OR NOT TO BE

DR. HOWARD C. ABBOTT, *Evansville College*

Life is a series of crises with man or animal. Success or failure, progress or retrogression, even life or death are determined by surmounting some crisis. Of the many and varied types of crisis in the experience of every individual there are two which we may consider; the conscious and the unconscious. Hereditary factors are recognized among the most determinative in human life. Birth, itself, is a supremely important unconscious crisis in the life of any new born individual.

The birth of a new individual combines the factors that have been expressed through generations. It is only recently that we have recognized that the early and unconscious experiences of children may determine the whole future direction of their lives. ''There are those who believe that most of one's attitudes throughout life are determined by the experiences that happen before the end of the third year.'' The child has no control over these unconscious crises of birth and the environment of early childhood. They are external to the conscious self of the child and the knowledge of their effect on life is not known to him in these early years. It is agreed that a child has a right to be well born: physically and mentally sound. The child has the right of wholesome influences during the years of early childhood in order to make possible a normal development and the fullest unfolding of innate faculties.

Has this early period of life, with these unconscious crises occurring, any influence on the child becoming a biologist? I believe it has. Parents may rear children and develop in them the joys of knowing animals as playmates and a fondness for them; or the converse may be true. An appreciation of the flowers and the trees, likewise, may unconsciously be impressed upon the child. Such guidance may extend to other matters in life, as religion, the stars of the heavens, etc., and rightfully should in order to bring the children into the fullest realization of their own faculties.

A conscious crisis deals with situations where a decision must be made. Choosing an occupation or profession is a crisis. Any crisis situation first lifts experience into clear consciousness and provides a condition for reflective thinking. The psychologist gives us the steps involved in reflective thinking:

First: The problem is felt.

Second: The situation is analyzed for its essential factors.

Third: A search is made of the person's own past experiences, his attitudes, his knowledge, his habits, his purposes, for whatever may be pertinent to the solution of the present problem.

Fourth: A search is made of the experience of the race for facts that are capable of throwing light upon the present situation.

Fifth: A search is made for all possible outcomes to the situation.

Sixth: The possible outcomes are criticised and evaluated in the light of the best experience of the race and a choice of that which seems to be the best is made.

Seventh: The chosen outcome is tried out by a process of experimentation until it is demonstrated that it is the best solution.

Eighth: The chosen solution is then adopted as a desirable way of life, and steps are taken to carry out the purpose.

How many biologists today gave this careful thought to the choosing of a life work? Miller (1) calls attention to the increasing number of occupational failures in modern society and industry. If we "intellectuals" would only use our intellects in some such careful analysis as that mentioned earlier, many misfits would be averted. The trouble is that too many of us just fall into the best-paying jobs that happen to yawn at us when we are ready to work. We become square pegs in round holes. Great care has been taken in selecting and perfecting our farm animals for the purpose they are best fitted to perform. Similarly, our plants have been selected and tested, and their adaptations and limitations are known. You would not select a Percheron horse to run a Kentucky Derby, neither would you select Louisiana corn to plant in South Dakota. Frequently such absurd choices are made by college students when selecting a major. Often, too, the choice is made by the parents, and no attention is paid to the tendencies of the boy or girl. One instance has been a constant reminder to me. The father decided that the son should study law, and in due time the son graduated from Syracuse University with a fine record as a law student. The son was talented in music and, after practicing law for six months, entered a musical career. How much greater would have been his career in music if he had studied five or six years at a conservatory of music?

Miller (1) says, "There are a very few occupations whose hereditary aspects we have recognized for a long time, but certainly not many. For instance there is the almost ancient expression, 'Poets are born not made'. While there was a time when almost anyone could fit into almost any occupation, the time has come now when all occupations are, like that of thinking and writing poetry, demanding that their occupants be born to them. One who is at the top of his profession is there because he was born to the profession,'' continues Miller, ''and because, in addition to that, he trained himself for it; he is ahead of others in the profession who may likewise have trained themselves, but who hadn't the hereditary start which he had. If we were as anxious about our occupations as we are about the 'occupations' of our domesticated animals, every one of us could be in the occupation to which he was born.''

How can we find the occupation to which each of us is born? How can we decide that Biology, with all its diversifications, is the field we are best fitted to occupy? It is a vocational question, and deserves an answer by an expert in vocational guidance. Yet, a biologist may view it from his simple aspect.

The first step toward biology as a choice of occupation is the unconscious experiences of childhood. This has been treated under the unconscious crisis.

A normal child goes through a series of choices as development of mind and body proceed. Usually the latest experience is the most dominant. Today he is a cowboy, tomorrow an aviator, and something different the next day. Close observation of these various inherent capacities should be made by teachers, parents or guardian, and a record kept which may be referred to when the crisis of choosing an occupation occurs. ''Such an idea certainly argues for a generalized curriculum in our public schools, and against early specialization. More than that, it argues for home stimulation and home observation, and for a variety of vacation pursuits.'' This constitutes the second step.

After this elimination process in the later teen-age there will remain a half dozen possible choices of an occupation. An analysis of parents and grand-parents for several generations should reveal tendencies toward certain vocations and failures in other fields. By a study of these hereditary tendencies, a further elimination of possible occupations can be made. This is the third step.

A fourth step that may prove beneficial is a study of the opportunities in the few fields for which the youth seems most likely to be a success. If one of these fields is biology, what characteristics of the youth should be taken as indicators?

First: A nature lover. Persons are nature lovers when they are absorbed in some biological phenomenon, as a bird, an insect, a germinating seed, or the fermentation of yeast. One experience is not enough, but the reoccurrence of this interest wherever these phenomena occur is suggestive. Such persons are often called "dreamers." All true biologists have experienced the thrill of such an experience. Time passes and they are unaware of it.

Second: A student of books. Knowledge is fundamental in any occupation. The nature lover, who is content to observe and never acquires the knowledge that his predecessors have recorded, will be a failure as a biologist. One must read comprehensively, consistently, and in several languages and must enjoy doing it.

Third: A questioning mind. Such a person is one who silently asks nature why she does so and so or who sees unsolved problems and plans methods of unraveling the hidden mystery. Only by such an attitude of mind can one see the causes that underlie these biological phenomena about us.

Fourth. Accuracy of observation. There is no place in biology for one who thinks it is so, or for the person who is satisfied with "good enough". Nature is exact and the mind of the biologist must deal in exactness, for one's reputation is at stake when committed to immature conclusions.

In the life of every college student there occurs the conscious crisis of choosing a major. What factors decide this momentous question in our colleges and universities today? Many times students come to their senior year and find they have majored in subjects which they do not wish to follow as a life work. They are square pegs in round holes. And why has this occurred? Whose fault is it? Can we hang the blame on the student, or is the system of education to which they have been exposed partly to blame? What does the boy or girl, fresh from high school, know of the kind of work done in the numerous departments of a college or university? What do they know of the opportunities in various fields? How do they know whether they will like history, mathematics, a language, or biology?

Some universities are experimenting with this problem. They are to be commended for their willingness to have criticism heaped upon them, because all institutions of higher learning will profit by their experiments. I refer to orientation courses that are given to students in the freshman and sophomore years, also to educational tests given freshman for intelligence, for vocations, etc. Some departments give orientation courses in science to show their inter-relationship. For the last five years the Botany Department at the University of South Dakota has incorporated into the elementary course a series of lectures given by professors in other departments of science. The program is given below.

Relation of Botany to Geology by Professor of Geology
Relation of Botany to Zoology by Professor of Zoology
Relation of Botany to Bacteriology by Professor of Bacteriology
Relation of Botany to Chemistry by Professor of Chemistry
Physical Phenomena in Plants by Professor of Physics.

There are many students graduated with an A.B. or a B.S. degree with a major in some field of biology. They have come through a certain departmental routine and are classed as biologists. They have met certain requirements, but have never caught a vision of some phase of biology as a life work.

Dean Edward W. Berry, Johns Hopkins University, believes that there are many of this ''drifter'' type doing graduate work in our universities. They are waiting for someone or something to decide what they should do. When a biological measuring stick is applied, they fall short. Some deans measure their teachers by the number of major students in their respective departments, and promotions are made accordingly. What biology teacher wishes to be measured by the number of students alone? Every biology professor is proud to point out the successful students, and observes with regret those who failed to measure up to the opportunity.

How may we biologists increase the percentage of successful majors and eliminate as far as possible the misfits? The biology teacher should make an analysis of each student in the class on some such basis as has been presented. This may be done in a large measure without the student being aware of the fact. Having formed a favorable conclusion, the teacher should focus his attention on training these students to be productive individuals in their chosen field, and on encouraging the research attitude of mind as Metcalf (2) has described it. If the conclusion as to the fitness of students for a biology major is unfavorable and the student is contemplating work in biology, then the path of duty for the teacher is to inform the students that their opportunity for a successful career is limited, giving such reasons as may be necessary.

Such a policy as herein described will give to the world biologists of a higher quality, and the number of misfits will be reduced to a minimum.

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(1) Miller, Ward L., A Biological Factor in the Choice of an Occupation. Social Science, Vol. 4, No. 4, 1929.

(2) Metcalf, Maynard M., The Research Attitude of Mind. University of Buffalo Studies, Vol. VII, No. 2, 1928.

CHAPTER SECRETARIES!

No matter what action your Chapter may take, it ultimately depends upon you whether the BIOLOGIST is kept up to the standard of other fraternity publications. You are the mesenteries that bind the structures of the society together. Where you slack up, Phi Sigma weakens. When you cease functioning, chapter atrophy begins.

The fact that your fellow members of Phi Sigma have seen in you qualifications of a good secretary is at once a distinction and a challenge. They honor you with their confidence, they challenge you to advance the reputation and the record of their corporate activities before the Phi Sigma world.

This should stimulate your ambition. It is not merely a campus matter. It is a national affair. There is nothing in the world to stop you from attaining the reputation of the *Best Chapter Secretary* in the Society. Why not go out aggressively for this distinction? Your Editor knows he can rely on the members of the Council to second the following program:

1. The Secretary, Dr. Ortenburger, will nominate to the Phi Sigma Hall of Fame those Chapter Secretaries who are more than ordinarily efficient in keeping their records up to date in the national files.

2. Each Secretary will be given personal credit for *every* live article submitted to the BIOLOGIST.

3. The aggregate of these two types of secretarial activity will enable the Council at its annual meeting to single out for distinguished service the really exceptional secretaries.

There is still time to get this program under way. Your contacts will be two,—with the National Secretary, and with the Editor. Your responsibilities to the former are *constitutional*. Your relations with the latter are what you choose to make them. Your Editor suggests:

a. Frequent reports on Chapter activities. These need not be lengthy, but they should be as definite and clear as the better articles in your campus newspaper. Cultivate scientific accuracy of expression.

b. Interesting current events in the lives of your better known Faculty Members.

c. Articles on notable discoveries made on your campus.

d. Short reviews or abstracts, of worthwhile papers published by student or faculty members of Phi Sigma.

e. The changes among alumni members of Phi Sigma.

f. The humor of the biological classroom. There is none more interesting or infectious. A solemnly detailed answer to the catch-question: "How does the rubber sponge reproduce?" recently upset the dignity of the Editor's classroom. Every Phi Sigma will recall similar occurrences.

A brief study of these topics will suggest many possibilities for interesting development. Sustained action along these lines cannot fail to produce results. The question is one of collaboration. Are the Chapter Secretaries willing to do so?

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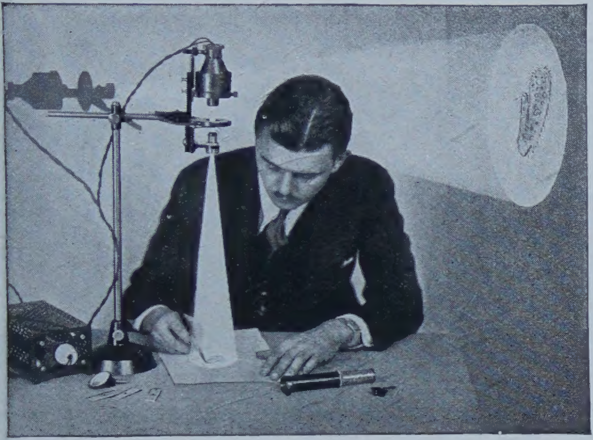

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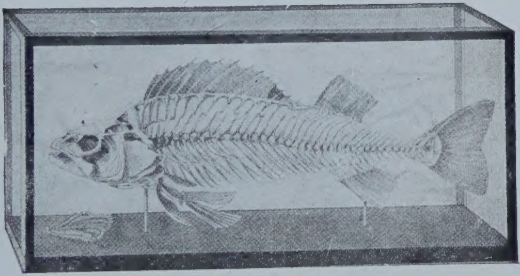

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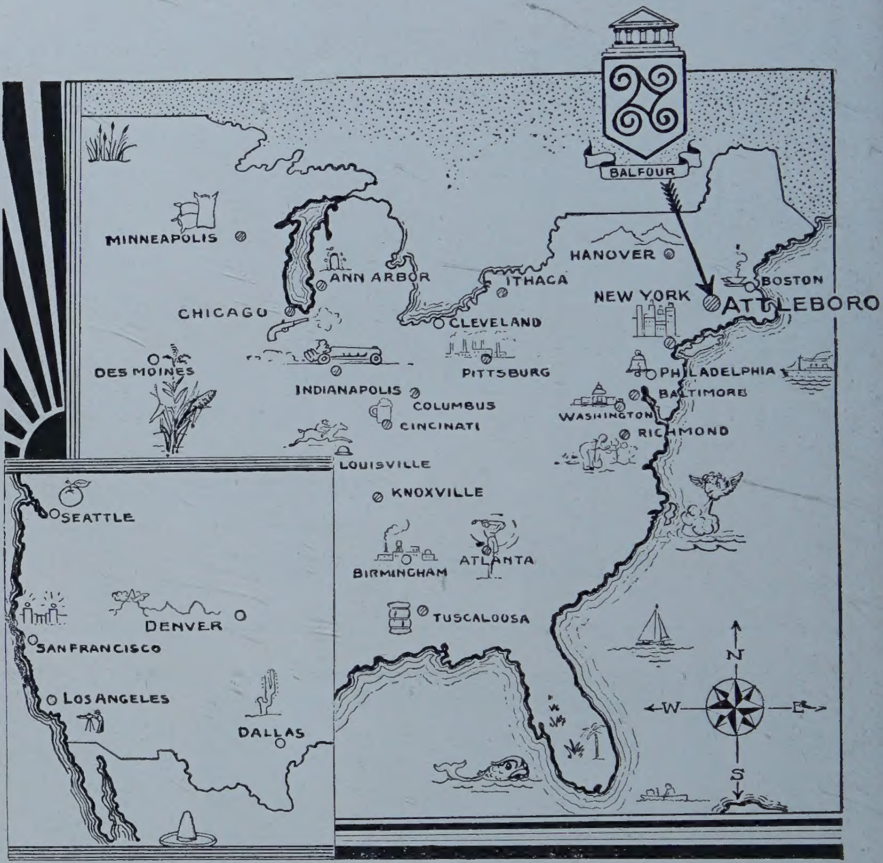

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